FEATURE-BASED AGILE TOOL SELECTION TO IMPROVE ESTIMATION OF HISTORICAL DATA

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ABSTRACT

Tools are help to track productivity for both team and individual. It allows quicker and consistent software creation. It gives the ability to respond change, use remote virtual resources and help to drive customer collaboration. The use of agile tool gives a clear line-of-sight to the customer on exactly, what the priorities are and when they expect as the end of the sprint/Iteration. Selection of Agile Tools for project management tool is very complicated task to the organization. To be a successful organization and development team, they need to use the tool to deal with the issues that accompany growing teams and product complexity. This paper discuss about available agile tools and technology, why they are important to the Agile project Management? How the agile project move to new technology? Technology assumes important . Technology assumes importance in the context of project management due to greater challenges in today's technology-enabled work environment where technology tools are routinely used for collaboration, communication and deployment of project management practice. However, technology can play a major role in supporting project managers in managing project effectively and efficienctly. Section1 : contain introduction to tools and technology. Section 2 contains Literature review. Section 3 contain , categories of Agile tools. Section 4 contains important criteria to select technology for the application. Section 5 contains Reusable Indicators to support estimation. Section 6 has conclusion.

I. INTRODUCTION

The Agile Manifesto emphasizes " Individuals and interactions over process and tools". But the Agile Manifesto is not suggesting which tools and technology has to use for project development. In Agile, there is no documentation to track progress. Tools are helps to track productivity, allow quicker and consistent software creation, give the ability to respond to change, use remote/virtual resources and help to drive customer collaboration. Depending upon the number of people in a development team, the selection tool is different. The tool should include different types of tasks, workflows, release planning, and comprehensive reporting. Choose a project management tools that allow the teams to set dependencies between different tasks. The ability to leave comments under tasks and receive notifications about challenges also facilitates communication with remote colleagues. Different categories of tools are discussed in the following section.

Technology is used to denote both the IT and KM for two reasons. 1) Knowledge Management (KM is considered as bridge between IT and business. 2) Combining both KM and IT will provide opportunities to enhance performance in project environment. Many organizations invest in technology to improve organizational performance and to gain competitive advantages. Technology's role in project performance depends on how technology systems are designed in organizations. Organization should

develop technology system to meet specific business and project needs and they should not be designed in isolation with the assumptions that people will use it for productive purposes.

II. LITERATURE REVIEW

In 2006 “Agile Project Management (APM), Tooling Survey Results” focused on collecting statistics on tools used in requirements management[1]. In 2008 “Agile tools: the good, the bad, and the ugly” mainly focused on tools used in agile projects[2]. In 2013, “8th Annual State of Agile,” written by the VersionOne Company includes a normalized and wide distribution of responses of multitude of channels from companies, engineers, scrum masters, product owners and even self-employed engineers[3]. In 2014,”Agile Tools Evaluator Guide” written by the VersionOne Company intended to help organizations in choosing software to support their agile teams and processes[4].Some of the Review from Web site gives the important feature about estimation reuse[5-9].

III. CATEGORIES OF AGILE TOOLS

The key to success in Agile development is to enable flexibility while maintaining organization. The best way to do this is to deploy a set of good tools that help to track the project and organize the team’s progress. They don’t impose strict schedules and roles, but merely make it easier for the developers to self-mange and converge on their goals. There are dozens of software products designed to help managers set priorities and developers write code that addresses them. Some of these tools are designed to track different forms of development including projects that are flexible enough to be used for agile development. Others are built specifically to fit the agile model and nurture as much programmer freedom as possible. The tool support the project by help to identify the requirements and split them into a number of smaller tasks than it tracks the programmers as they work collaboratively on the parts. The process is often split up into short cycles that gradually converge on the final result. The cycles alternate between planning session and code sprint. Keeping the cycle short and including plenty of developer feedback in the planning lets the team adjust and focus. A good agile tools organize the discussion and planning. The developers can focus on each of the features, tasks or bugs in separate threads. Splitting the discussion up helps the project move forward at the right for each section.

AGILE TOOLS		
SOURCE CONTROL TOOL	CONTINOUS INTEGRATION TOOL	PROJECT MANAGEMENT TOOL
Git	Hudson	Jira agile
Mercurial,	Jenkins	Taiga
Subversion	Travis CI	Trello
CVS	Strider	Zoho
	Integrity	Pivotaltracker
		versionone

Table 1.

These three tools are forming the foundation teams rely upon to ship code on time or even ahead of schedule.

A. SOURCE CONTROL TOOL:

All source control tool allow to keep track of the changes made to source files. It also give how the software has evolved over time. This can provide a deeper understanding of code that can be obtained by just looking at the current state. To compare the source files with the new files snapshot facility is provided. Use the source control tool(version control system) to "checkout " the source as it at the time of first Release. By investigating its behavior, specific version can be build. Real projects have many more check-ins. Branching facility in source control tool allows variations to be developed from a common base version. Branching are in two types: a)release branching b) feature branching.

B..CONTINUOUS INTEGRATION TOOL.

Merging and integrating code is the practice of continuous integration, which is core to the Agile approach to software development. Continuous integration enables the Agile approach of delivering small improvements that slowly but surely moves the development towards the target. The target is the product owner's understanding of what is needed and which may itself be moving Each individual development task called a user story, needs to be small enough to be completed in few days, if the task is larger than that, then it needs to split up.

C. PROJECT MANAGEMENT TOOL

FEATURE	GIT	MERCURAL
DESIGN	SUBJECT TO NUMEROUS PARALLED BRANCHES FROM ITS ORIGIN	NIT HAVING SUCH DESIGN
EXECUTION ENVIRONMENT	MORE LINUX FRIENDLY	MORE WINDOWS FRIENDLY
LANGUAGE	C, PERL, & BOURN SHELL	PYTHON
USABILITY	PROVIDES ESSENTIAL FUNCTIONS IN BUNDLE EXTENSION	PROVIDES ESSENTIAL FUNCTIONS IN A COMPACT AND FASHIONABLE STYLE
REPOSITORY CONFIGURATION	SNAPSHOTS	PATCH
CHANGE HISTORY FILE FORMAT	COMPRESSED DIFF FILE	BINARY FILE FORMAT
SNAPSHOT OPERATION COST	LESS COST THAN MERCURIAL	HIGHER COST THAN GIT
MERGE	N-WAY MERGE	2-WAY MERGE
PERFORMANCE	CONSISTENT AND FASTER PERFORMANCE IN LARGE SCALABLE PROJECTS	STABLE PERFORMANCE

Table 2.

The use of Agile Project Management tool gives a clear line-of-sight to the customer on exactly what the priorities are and when they can expect at the end of sprint/ Iteration. Agile is founded on

simplicity and the tools used should reflect this. Many tools offers a free trial period, that allows the team to understand the functionality and how to integrate within the organization. Teams can take this opportunity to understand key features that are pertinent to what metrics and reporting may be critical to their organization's needs. It also allows teams to see a full view of what they can expect while running an agile project by creating reports and planning stories.

IV. STRATEGY TO SELECT TOOL

A. SOURCE CONTROL TOOL FEATURES.

A version control system records changes carried out to a file, or a set of files over time, and helps to recall specific versions of the code later on when need it. Source control tool should include code repository. In case of software development teams the code repository used to maintain the database of code changes. Code needs to be changed from time to time. Product features and software functionality need to be updated as and when market conditions change and end users provide new feedback. Teams have to work upon features already developed and offer extra functionality so the product can remain competitive in the market. Thus new versions of existing code have to be developed by the team from time to time. One of the major benefits of a source control tool is that if some mistake occurs during coding due to some reason, developers have an option to turn back the clock and easily compare earlier code versions and fix the mistakes so disruption occurring to other team members can be minimized. There are four important source control tool. They are CVS, Subversion, Git and Mercurial. Git is Distributed Version Control System (DVCS). Unlike CVS or Subversion (SVN) repositories, Git allows developers to create their own, personal copy of the team's repository, hosted alongside the main codebase. These copies are called forks and when work is complete on a fork, it's easy to bring changes back to the main codebase. Besides the benefits of flexibility and distribution, there are key functions of Git that support and enhance agile development. Think of Git as a component of agile development; changes can get pushed down the deployment pipeline faster than working with monolithic releases and centralized version control systems. Git works the way your agile team works (and should strive to work). Table I describe the feature based comparison between git and mercurial to implement reusability.

B. AGILE PROJECT MANAGEMENT TOOL FEATURE:

Agile project management tool can be selected by better product quality, higher customer satisfaction, higher customer morale, increased collaboration and ownership, customized team structure, more relevant metrics, improved performance visibility, Increased project control, Improved project predictability and Reduced risk. Companies that are successful in agile software development know that "Individuals and Interactions" are more important than "Processes and Tools"; but the right agile tools really can affect the enterprise, especially when interactions can be more productive. To prepare a list of the best tools in the market, firstly, more than 200 blogs, web pages, including reviews, tutorials and online books have been read. Afterward, we reviewed papers, surveys, and white papers, especially those which had been published in recent years. Thus, how top agile tools are provided and which important factors are essential to implement reusability, are discussed in this section.

1 CRITERIA TO CONSIDER

To prepare a list of the most important criteria to satisfy reusability in agile, all of the recent surveys were considered. Important core criteria definition is presented as follows

1.1.DASHBOARD:

It contain overall performance and progress or highlight a particular problem. It displays critical information to help to track progress toward completing the project.

1.2 TIME TRACKING/BUG TRACKING:

It include data for future project costing/estimation, the ability to value work in process, data for processing payroll efficiently, data for billing/invoicing automation and insight into costs.

1.3.COLLABORATION:

It increases the speed of project execution, better project input, **Working with Distributed Teams,** the ability to simultaneously see the big picture and drill down to the fine detail, it speeds business communication and scaling up is as easy as clicking a mouse to make a change to the plan.

1.4.USER INTERFACE:

It provides better understanding of the problem, allows rapid testing and validation of story concepts before time consuming coding,provides a clear, sociable visual representation of the project vision,provide usability

1.5.PORTFOLIO:

It include centralized management of the processes, methods and technologies used by project managers and project management offices to analyze and manage current or proposed projects based on numerous key characteristics.

AGILE PM TOOL	DASHBOARD	TIMETRACKING	COLLABORATION	USER INTERFACE	PORTFOLIO
JIRA AGILE	FLEXIBLE DASHBOARD	YES	YES	YES	YES
TAIGA	SHORT LIST OF PROJECT	NO	YES	X [NOT MUCH FRIENDLY[	OTHER PPM USED
TRELLO	VISUAL DASHBOARD	NO	YES	YES	YES
ZOHO	DRAG&DROB BASED	YES	YES	YES	OTHER PPM USED
PIVOTAL TRACKER	DIFFICULT TO MAINTAIN FOR A LARGE TEAM	NO	YES	X [SLOW]	OTHER PPM USED
VERSION ONE	ANALYTIC FEATURE COMPLETION	NO	YES	YES	YES
TARGET PROCESS	GRAPHICAL DASHBOARD	YES	YES	YES	YES
ACTIVE COLLAB	PERSONAL &CLIENT DASHBOARD	YES	YES	YES	Other PPM Used

Table 3.

V. REUSABLE INDICATORS FOR ESTIMATION

Agile Project Management tool include variety of features, among that most important feature to be reused for estimation purpose.

- If OP(T, Tech, D, WE) is equal to NP(T,Tech,D,WE) then
- Reuse (Est. Stat., Track. Stat., Velocity and Progress. Schedule)
- Else
- Use Expert Estimation
- End if

[Note: T-Tools, Tech-Technology, D-Domain, WE-Working Environment]

A.TIME TRACKING:

1. ACCURATE ESTIMATES: Good historical data on actual time spent will allow to greatly improve the ability to estimate tasks and projects, and will help to gain credibility on estimates and provide the management and prospective customers. If the project having historical data, then the following field can be reused for new project management.

2. ESTIMATION STATISTIC AND TRACKING STATISTIC: choose type of units (e.g. Story Points, Issue Count) that will be used for estimating and tracking issues. For this, first choose an Estimation Statistic, then choosing to either use the same units for Tracking Statistic or to use time-tracking. Estimation statistic field can be Story Points or Business Value or Original Estimate or Issue Count. **Estimate** field is editable when an issue is in the Backlog, but not editable once the issue moves into the Active sprints. **Time Tracking** field can be Remaining Estimate and Time Spent or None

3. VELOCITY AND BURN DOWN: A team's velocity is based on the Estimation Statistic — ie. for each sprint, the velocity is the sum of the Estimation Statistic for completed stories. Velocity is shown in the Velocity Chart and also on the Sprint Report in the Estimate Statistic of the "Completed Issues" table. Changing the Estimate value afterwards will not be reflected in the Sprint Report, but will be shown as scope change in the burn down. Velocity is also used in the Version Report to predict Release Dates. The Sprint Burn down Chart is based on the Tracking Statistic. If the Story Point is used in Tracking Statistic, then the Burn down Chart shows the Story Points per story. Version Report has the details of Predicted Release Date, the Predicted Release Date(optimistic) and the Predicted Release Date(Pessimistic)

B. USER INTERFACE

1. IMPROVES BASIS FOR ESTIMATION : Visualization of what the application will look like and behave helps identify how functionality can best be developed for maximum performance with minimum development effort. What may appear like simple cards, once brought to life can become complex, with functionality needing to be broken down into component story cards. For example, in developing functionality for a retail organization to search for products sold in specific stores in the first instance appeared to be a minor request. However, once the storyboards had been developed it became clear that different, complex search criteria would be required to deliver the results the business was seeking. The storyboards helped better articulate the requirement and resulted in the requirement spanning two stories (iterations) with a more accurate estimate for the effort to complete them.

C. DASHBOARD

1. PROJECT PROGRESS SCHEDULE: Indicates time elapsed over total time until a given date expressed in percentage. That reflects actual process of the project in terms of time allocated to the project. If estimated product backlog and planned **sprints are** available then this could be relation between completed sprints over total sprint.

2. DELIVERED BUSINESS VALUE :If the team has an estimated business value per story(Business value points) in product backlog, this is the sum of delivered business value points(DONE user stories) over the total business value points estimated for the entire product backlog. This reflects the actual progress of the project in terms of business goal achieved. The total amount of delivered business value points is validated with every sprint demo.

3. DELIVERED STORY POINT: A simple bar chart indicating estimated versus delivered story point to track estimation accuracy and even detect other hidden issues like potential risks.

VI. CONCLUSION

Selection of agile tool for project is very complicated task. This paper describes the feature of source control tool and project management tool to reuse for new project estimation. It concludes which field are reused for estimation purpose at the initial stage of a project to improve the productivity for the software engineer. In this, some of the top tools are consider for evaluation purpose. In future, tools feature may be extended for other reusability concept.

REFERENCES

[1] Behrens, Peter. "Agile Project Management (APM) tooling survey results." Trail Ridge consulting (2006).
[2] Dubakov, Michael, and Peter Stevens. "Agile Tools: The Good, the Bad and the Ugly." Report, TargetProcess, Inc (2008).
[3] VersionOne.com. "The 8th Annual"State of Agile" Survey."
[4] http://devmethodologies.blogspot.in/2016/09/agile-version-control.html
[5] Git Official Site
http://git-scm.com/
[6]Mercurial Official Site
http://www.selenic.com/mercurial
[7]Git vs. Mercurial: Please Relax
http://importantshock.wordpress.com/2008/08/07/git-vs-mercurial/
[8]The Differences Between Mercurial and Git
http://www.rockstarprogrammer.org/post/2008/apr/06/differences-between-mercurial-and-git/
[9]http://www.disciplinedagiledelivery.com/reuse-categories/